IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

DEMARAY LLC, Plaintiff, v. **INTEL CORPORATION,** Defendant.	**Case No. 6:20-cv-00634-ADA** **JURY TRIAL DEMANDED**
DEMARAY LLC, Plaintiff, v. **SAMSUNG ELECTRONICS CO., LTD (A KOREAN COMPANY), SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG SEMICONDUCTOR, INC., and SAMSUNG AUSTIN SEMICONDUCTOR, LLC,** Defendants.	**Case No. 6:20-cv-00636-ADA** **JURY TRIAL DEMANDED**

PLAINTIFF DEMARAY LLC'S OPENING CLAIM CONSTRUCTION BRIEF

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[1] Defendants have proposed ten terms for construction (with a total of twelve terms) in excess of the limits on terms in the Court's Standing Order.

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* Unless otherwise noted, internal citations and subsequent history are omitted, and emphasis is added.

The "Demaray Patents" are U.S. Patent Nos. 7,381,657 and 7,544,276 ("'657 patent" and "'276 patent," respectively) (Exs. 1-2). All exhibits are attached to the Declaration of C. Maclain Wells ("Wells") filed herewith. Also referenced is the Declaration of Dr. Alexander Glew ("Glew") also filed herewith.

I. INTRODUCTION

The claim interpretation process "is simply a way of elaborating the normally terse claim language in order to understand and explain, ***but not to change***, the scope of the claims." *Embrex, Inc. v. Service Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Claim construction also "is not an obligatory exercise in redundancy" requiring courts to substitute other language for understandable claim terms. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.,* 521 F.3d 1351, 1362 (Fed. Cir. 2008). Only Demaray's proposed constructions follow those principles.

Defendants seek unnecessary revisions of well-understood terms, most of which either (i) add new limitations that appear nowhere in the claims themselves, or (ii) seek to alter plain claim language, often in a manner that is technologically misplaced, disregarding the "heavy presumption that claim terms are to be given their ordinary and customary meaning." *See Aventis Pharms., Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013). Indeed, in four recent *inter partes review* petitions in which both defendants are real parties in interest, they did not seek construction of even a single claim term. Wells, ¶ 12.

II. THE DEMARAY PATENTS

As described in Demaray's technology tutorial, the Demaray Patents generally concern equipment and processes used to deposit thin films in the production of semiconductor products. Layers of those films, which are deposited in chambers within reactors, form structures such as transistors and electrical interconnections of the sort that make up modern integrated circuits. The patents focus on a process called physical vapor deposition (PVD) sputtering in which metal particles from a "target" create a plasma that deposits the films on a semiconductor wafer. The patents describe approaches for preventing undesired buildup of the deposited material on the target surface ("poisoning") and damaging electrical "arcing" that it can cause using pulses of DC power. These approaches are useful with a broad array of process gasses "includ[ing] combinations

of Ar, N2, O_2, C_2F_6, CO_2, CO and other process gasses" (Ex. 1, 3:5–9) used in depositing a wide variety of thin films including "oxides, fluorides, sulfides, nitrides, phosphates, sulfates, and carbonates, as well as other wide band gap semiconductor materials" (*id.*, 2:55–56, 7:47–52, 16:19–24). An insight of the inventors was that a narrow band rejection filter can be used to protect the DC power supply from damaging feedback from a RF bias. *See* Ex. 4 at DEMINT00002521.

III. DISPUTED CONSTRUCTIONS

A. "Substrate" ('657 Patent, cls. 1, 2, 7, 11; '276 Patent, cls. 1, 2, 6, 10)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "material that provides the surface on which something is deposited or inscribed, for example a silicon wafer used to manufacture integrated circuits"	"base support structure"

1. This Term Does Not Require Construction

"Substrate" should be given its plain and ordinary meaning, which encompasses the material receiving the thin film. "Because the plain and ordinary meaning of the disputed claim language is clear," there is no need to rewrite the term. *See Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015).

To the extent a further construction is deemed necessary, a substrate is a "material that provides the surface on which something is deposited or inscribed, for example a silicon wafer used to manufacture integrated circuits." This is consistent with the intrinsic record, which teaches that a "substrate" is the material that the film is "deposited on." *E.g.*, Ex. 1, 2:55–56; 5:28–29; 6:24–65; 7:47–50; 8:33–37. The patents also make clear that "[a] substrate can be any material and, in some embodiments, is a silicon wafer." *Id.*, 2:61–62; *see also* 7:62–65 ("Substrate 16 can be a solid, smooth surface. Typically, substrate 16 can be a silicon wafer or a silicon wafer coated with a layer of silicon oxide formed by a chemical vapor deposition process ….").

This construction is also consistent with common dictionary definitions. The New Oxford

American Dictionary, for example, defines "substrate" as "a substance or layer that underlies something, or on which some process occurs, in particular … a ***material that provides the surface on which something is deposited or inscribed, for example the silicon wafer used to manufacture integrated circuits***." Ex. 5 at DEMINT00003513. Demaray's proposal tracks the emphasized language verbatim and is consistent with usage of the term in the art. Glew, ¶¶ 25-27.

2. Defendants Seek To Import Narrowing Limitations Contrary to Plain Meaning And The Patent Specifications

Defendants' proposal to redefine "substrate" as a "base support structure" raises numerous problems. To begin with, it does not clarify the term. Rather, it replaces a well-understood term with a brand new phrase of uncertain meaning, raising more questions than it resolves. Nonetheless, in some respects it is plainly overly broad. For example, the foundation of a building or a television stand would be a "substrate" under defendants' definition. In other respects, the proposed construction is plainly too narrow. For example, the "base" modifier could imply that when a substrate is placed on another support structure (*e.g.,* a mounting block in a reactor), it would no longer be a "base" structure and therefore not a substrate. That is not how the term is used in the art or in the Demaray Patents. The patents teach "[s]ubstrate 16 can be supported on a holder or carrier sheet that may be larger than substrate 16." Ex. 1, 8:1–3.[2] Defendants' suggestion that the "holder or carrier sheet" would transform into a substrate as soon as a silicon wafer is placed upon it, and that the silicon wafer would simultaneously cease to be a substrate when placed in position for processing, makes no sense and is inconsistent with the patents and ordinary usage.

[2] Multiple other patents to Dr. Demaray cited on the face of the Demaray Patents (and therefore intrinsic evidence), similarly describe a "support structure" that *holds* a substrate, as opposed to requiring the substrate itself to be the "base support structure." *See, e.g.,* Ex. 8 (Patent 5,565,071), 2:23–26 ("[In] FIG. 1, the sputtering chamber 60 includes an object ***(substrate) support structure 62 on which rests the substrate*** to be deposited 61."); Ex. 9 (Patent 5,603,816), 2:16–17 ("[In] FIG. 2, the sputtering chamber 30 includes a[n] object ***substrate support structure 32 on which the substrate to be deposited 31 rests***.").

As another example, defendants' narrowing "base" limitation could be used to erroneously suggest that a substrate must always be monolithic, and can never include layers of materials previously deposited that are, in turn, supported by another layer underneath. The ordinary meaning of the term is certainly not so limited, nor is its usage within the Demaray Patents. To the contrary, the specifications are clear that such layers often are part of the substrate: "[t]ypically, ***substrate 16 can be*** a silicon wafer or ***a silicon wafer coated with a layer of silicon oxide***." Ex. 1, 7:62-64; *see also* 18:10–12 (example deposition on a "6 inch wafer of substrate 16 which includes a 10 μm thick thermal oxide substrate."); 18:55-57 ("substrate 16 is a silicon substrate with an undercladding layer of thermally oxidized SiO2 …."); Glew, ¶¶ 28-32. Defendants cannot redefine "substrate" to be inconsistent with the patent and exclude preferred embodiments.

B. "A method of depositing a film on an insulating substrate, comprising" ('657 Patent, cl. 1)

Demaray's Proposal	Defendants' Proposal
Preamble is not limiting	The Preamble is limiting and "insulating substrate" means "insulating base support structure"

1. The Preamble Is Not Limiting

Preambles presumptively do not limit claims. *Am. Med. Sys., Inc. v. Biolitec, Inc.,* 618 F.3d 1354, 1358 (Fed. Cir. 2010). Moreover, "a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention." *Catalina Mktg. Int'l, Inc. v. Coolsavings.com Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). In assessing whether the presumption that a preamble is non-limiting can be overcome, courts consider whether: (1) the preamble provides antecedent basis, (2) the preamble is essential to understand limitations or terms in the claim body, (3) the preamble recites "additional structure or steps underscored as important by the specification," and (4) there was "clear reliance on the preamble during prosecution to distinguish … prior art." *Id.* at 808–09. Here, only the first of these four factors even remotely weighs against the presumption that the preamble of claim 1 is

non-limiting. The preamble uses the term "insulating substrate," which is related to the "substrate" referenced later in the claim. Ex. 1, cl. 1. But because this language merely provides context for the claimed method, all the material steps are recited in the body of the claim. This single factor does not overcome the presumption, supported by each of the other three factors, that the preamble is not limiting. *See Asset Guard Prods. v. Sentinel Containment, Inc*., 2018 WL 6248533, at *4 (S.D. Tex. Nov. 29, 2018) ("While Sentinel is correct that these terms are introduced with the articles 'a' or 'an' in the preamble, and later referred to as 'the' in the body, ***this is not dispositive. These terms are not essential to understand limitations or terms in the claim bodies*** …."); *see also Catalina*, 289 F.3d at 808 ("Whether a preamble … constitutes a limitation ... is determined on ***the facts of each case in light of the overall form of the claim*** ….").

The preamble merely provides context for the claimed method steps. *See TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1324 (Fed. Cir. 2015); *see also Summit 6*, 802 F.3d at 1292 (preamble not limiting where it provided context for the claimed method and all material steps were recited in the body of the claim). The term "insulating substrate" is not essential to understand terms in the claim body. The only structure to which it relates is the "substrate," which as explained above is readily understandable on its own. The term "insulating" is not repeated in the claim body and is not necessary for the performance of the method steps, which relate to thin film deposition using a specific reactor configuration, not a specific type of substrate. Ex. 1, cl. 1. To the contrary, the specification teaches that the "substrate can be any material and, in some embodiments, is a silicon wafer." *Id.,* 2:61–62.

In addition, the preamble was not relied upon to distinguish the claims during prosecution and is not underscored as important in the specification. It is thus more akin to a statement of purpose. *See Marrin v. Griffin*, 599 F.3d 1290, 1295 (Fed.Cir. 2010) ("the mere fact that a

structural term in the preamble is part of the claim does not mean that the preamble's statement of purpose or other description is also part of the claim."); Glew, ¶¶ 33-34. Such "a statement of intended use" of claimed method steps is non-limiting. *See Cochlear Bone Anchored Sols. AB v. Oticon Med. AB*, 958 F.3d 1348, 1355 (Fed. Cir. 2020) (statement of intended use not limiting).

2. Defendants Seek To Narrow The Claims To A Subset Of Monolithic Substrates

During the meet and confer process, defendants admitted that they are seeking based on the preamble to narrow the claimed method to deposition of thin films on a monolithic substrate consisting exclusively of non-conductive material. But neither the preamble, nor the body of the claims, says anything about the substrate being monolithic or exclusively non-conductive.

Defendants' position disregards the patents' teaching that the claimed methods can be used with "any type" of substrate. Ex. 1, 2:61–62. Defendants' position also contradicts numerous preferred embodiments involving substrates that include layers of insulating materials that have been deposited on top of other materials—as well as materials containing conductive elements such as traces and transistors—that are also part of the "substrate." In these preferred embodiments, for example: "[t]ypically, substrate 16 can be a silicon wafer or a silicon wafer coated with a layer of silicon oxide formed by a chemical vapor deposition process or by a thermal oxidation process." *Id.,* 7:62–65; *see also id.*, 18:10–12 (describing example deposition on a "6 inch wafer of substrate 16 which includes a 10 μm thick thermal oxide substrate."); Ex. 12 (App. 2002/0140103) ¶ 23 ("A substrate 12 that may include a trace 14 (or the top of a contact) includes an etch stop layer 18 above and on a diffusion barrier layer 16."); Ex. 13 (App. 2004/0259305) (cls. 41 & 81: "wherein the substrate includes a transistor structure."). Thus, any construction that suggests the substrate must be monolithic or entirely non-conductive is contrary to both the intrinsic record and the technology at issue. Glew, ¶¶ 35-37.

C. "Pulsed DC power" ('657 Patent, cls. 1, 2, 11; '276 Patent, cls. 1, 6)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "direct current power that oscillates between positive and negative voltages"	"DC power in the form of a square wave at a set frequency, reverse time, and amplitude"

1. This Term Does Not Require Construction

There is no need to construe "pulsed DC power." It should be given its plain and ordinary meaning, which encompasses DC power provided in the form of one or more pulses, as already described in contextual claim language not in dispute: "alternating negative and positive voltages."

If further construction is deemed necessary, "pulsed DC power" is "direct current power that oscillates between positive and negative voltages." This comes from the patents, which teach "[f]or pulsed reactive dc magnetron sputtering, as performed by apparatus 10, ***the polarity of the power supplied to target 12 by power supply 14 oscillates between negative and positive potentials***." Ex. 1, 5:36–39. The claims likewise call for the target to be supplied with "pulsed DC power" that it "alternates between positive and negative voltages." *See, e.g.,* Ex. 2 ('276 patent), cl. 1. Thus, the "pulsed" nature of the DC power is explained in immediately following claim language not in dispute—"alternating negative and positive voltages." Similarly, in prosecution, "Applicants … explicitly defined pulsed DC power to refer to ***power that oscillates between positive and negative voltages.***" Ex. 3 ('356 FH) at DEMINT00001305.[3]

Demaray's construction addresses characteristics that are ***definitional***, and does not (unlike Defendants' proposal discussed below) improperly attempt to smuggle ***optional implementational details*** into the claims. For example, while certain DC power supplies can, where desired, be

[3] *See also, e.g.,* The Modern Dictionary of Electronics (defining "pulse" as "[a] brief excursion of a quantity from normal"—here, an oscillation from a positive to a negative voltage, and back). Ex. 6 at DEMINT00003508; Glew, ¶¶ 38-41.

engineered to provide a "square" wave at specific "set" parameters, or to have symmetrically oscillating waveforms, DC power supplies that provide a wide variety of other wave shapes and varying parameters are equally commonplace. The patents teach that these sorts of parameters are adjustable to suit particular implementations and operating conditions occurring in real time, *e.g.*: "[t]he reverse pulsing time is determined by the amount of arcing generated during the process. Longer reverse time means longer discharge time and thus less arcs. However, if the reverse time is too long, the deposition rate will decrease." Ex. 1, 10:54–59; *see also id.*, 22:7–11 ("The frequency of the pulsed DC power is between about 100 and 200 Khz. Some depositions were performed at 200 kHz while others were performed at 100 kHz. The reverse time was varied between about 2 μs and about 4 μs …."). The patents also make clear that the power characteristics can vary depending on the power source: "utilization of other power supplies will lead to different power characteristics, frequency characteristics and reverse voltage percentages." *Id.*, 5:51–53. This is underscored by other intrinsic evidence as well, as discussed below. Ex. 14 (2003/0035906) ¶ 80.

The general term "pulsed DC power" is not restricted to only a single, highly particularized, pulsed DC waveform geometry, but rather, encompasses a variety of potential waveforms of the general type claimed. As described in the Demaray Patents, the particular parameters defendants seek to "fix" for all purposes can, even in preferred embodiments, be adjusted as dictated by conditions that change during processing.

2. Defendants Seek To Narrow The General Term To A Highly Specific Subset Of Pulsed DC Power

Defendants seek to import a series of limitations, using terminology such as "square wave," "reverse time," "amplitude," that are foreign to both the claims and jurors. Making claims harder to understand by adding concepts they do not contain is not proper claim construction.

Defendants' proposed "square wave" limitation with preset parameters is not required by

anything in the intrinsic record, and is contrary to common usage of the general term at issue. Glew, ¶¶ 42-47. Nothing in the claims or specifications mandates that a DC pulse must always have a particular waveform geometry. To the contrary, as discussed above, the patents teach that such waveform parameters can be varied depending on the process. Additional intrinsic evidence reaffirms that a square wave is only one option for pulsed wave shapes: "[a]lthough shown here as a square wave, ***any waveform*** oscillated between a negative voltage portion and a less negative or zero voltage portion ***may be used to advantage***." Ex. 10 (Patent 6,350,353), 5:57–63, *see also id.*, cls. 3-4 (describing a "pulsed DC power source"). Similarly, other intrinsic evidence underscores that the pulse parameters can vary and a "bi-polar pulsed DC (square waveform)" can have "***positive and negative pulse widths [that] are adjustable over a considerable range***." Ex. 14 (2003/0035906) ¶ 80. As yet another example, a reactor system can use "pulsed DC power" when an arc is detected, not at a "set … time." Ex. 16 at DEFTS-PA_003062, Fig. 5 (showing pulse of DC power); -3058 (describing pulsed DC power "approach that forcibly reverses the target voltage to a few tens of volts higher than the plasma potential"). All of this intrinsic evidence contradicts the defendants' proposal that pulses be narrowed exclusively to "square" waveforms with "set" parameters. *See also* Glew, ¶ 43 (explaining model square wave forms).

Defendants' construction requiring a set frequency and reverse time also implies that the waveform never changes and is constantly pulsing. The claims, in contrast, only require, for example, that the "target alternates between positive and negative voltages" (*e.g.,* Ex. 1, cl. 1); there is no requirement that pulses be provided constantly. To the contrary, the patents teach that pulses are provided to the target to prevent arcing: "[t]he reverse pulsing time is determined by the amount of arcing generated during the process. Longer reverse time means longer discharge time and thus less arcs. However, if the reverse time is too long, the deposition rate will decrease." *Id.,*

10:54–59; *see also id.*, 5:41–43 ("To obtain arc free deposition, the pulsing frequency exceeds a critical frequency that depend on target material, cathode current and reverse time."). Thus, in the preferred application, DC power is pulsed when arcing is detected, not constantly. *See also*, Glew, ¶ 44. Other intrinsic evidence is in accord. Ex. 16 at DEFTS-PA_003062, Fig. 5; -3058 (using pulsed DC power when an arc is detected, and a waveform that is not a square wave).

Defendants seek to import extraneous limitations about "a square wave at a set frequency, reverse time, and amplitude" from a specific, explicitly non-limiting, example in the specification. *See* Ex. 1, Fig. 4 (and associated description). But the specification makes clear that "Figure 4 illustrates ***an example deposition process only***" when it describes the parameters of a particular pulsed DC power supply in the example as being "set, ***including*** the power, frequency, and reverse pulsing time." *Id.*, 13:39–46. To avoid any possible doubt, the patents further state that these examples are "exemplary only and are not intended to be limiting" and should not limit the claims because "[o]ne skilled in the art can vary the processes specifically described here in various ways." *Id.*, 22:59–67. The details in the example defendants seize upon are plainly not the only way pulsed DC power can be supplied, and nothing in the claims or specification limits the general term "pulsed" in such a highly specific manner. Defendants' effort to narrow claims based on specification examples is contrary to settled law. *Phillips v. AWH Corp.*, 415 F.3d 1301, 1323 (Fed. Cir. 2005) (courts must "avoid importing limitations from the specification into the claims").

Defendants' proposed construction would also exclude preferred embodiments. The patents teach "[t]he reverse pulsing time is determined by the amount of arcing generated during the process. Longer reverse time means longer discharge time and thus less arcs. However, if the reverse time is too long, the deposition rate will decrease." Ex. 1, 10:54–59. Varying the reverse pulsing time as described could create a wide variety of shapes other than a square wave. Glew,

¶ 45. In addition, the patents address the problem of insulating material buildup on the target causing voltage drops. Ex. 1, 17:7–10 ("When target 12 under goes the transition from metallic to poison mode, the target voltage drops …."). That voltage drop would also naturally result in waveforms other than square waves. Glew, ¶ 45.

Indeed, defendants seek a construction that fundamentally misdescribes the technology at issue. *Id.,* ¶¶ 46–47. The intrinsic evidence explains that perfect square waves "virtually never" occur in practice. *See* Ex. 15 at 2 ("***The pulse may be intended to be square (in that only two levels are expected***) … ***In practice, the waveforms are virtually never as intended due to nonlinearities of either the plasma or the power supply circuitry. So, the shapes of the resulting power waveforms are complex.***"). Accordingly, beyond the many other problems noted above, Defendants' proposed limitations are also technologically unsound and presumptively incorrect. *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 904 F.3d 965, 972 (Fed. Cir. 2018) (holding that inoperable construction was wrong where "no real-world power supply controllers could operate with an absolutely fixed, or non-varying, frequency").

D. "Pulsed DC power supply" ('276 Patent, cls. 1, 6)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "supply for providing [pulsed DC power]"	"power supply, which provides DC power in the form of a square wave at a set frequency, reverse time, and amplitude"

1. This Term Does Not Require Construction

There is no need to rewrite "pulsed DC power supply." The term simply adds the common word "supply" to the phrase already addressed above. Its plain and ordinary meaning is a supply for providing pulsed DC power. The term is used in the intrinsic record in that ordinary sense: "***the power supplied to target 12 by power supply 14*** oscillates between negative and positive potentials." Ex. 1, 5:36–39. And as explained above, pulsed DC power is DC power provided in

the form of one or more pulses, as described in contextual claim language that is not in dispute.

2. Defendants Again Seek To Limit The Term To A Preset, Continuous Supply Of Pulsed DC Power

Defendants do not appear to dispute that a pulsed DC power supply is simply a supply for providing pulsed DC power. Nor do they dispute that the only difference between this term and the one before it is the additional word "supply." Both parties repeat that word verbatim in their constructions, underscoring that neither party really thinks it requires construction. *See, e.g.*, *Biscotti Inc. v. Microsoft Corp.*, 2016 WL 6611487, at *9 (E.D. Tex. Nov. 9, 2016) ("The parties do not appear to dispute that one skilled in the art would not need construction of the term itself as both parties merely repeat the language of the term in their constructions.").

But defendants to not stop there. They attempt—for a second time—to inject through this term the multiple extraneous limitations they seek to add to "pulsed DC power." That is doubly improper, first because as explained above they do not belong in "pulsed DC power," and second because this would create redundancies in the claims. Glew, ¶¶ 48-49. For example, as inserted into one limitation in independent claim 6 of the '276 Patent, defendants' proposals would read: "when DC power in the form of a square wave at a set frequency, reverse time, and amplitude from the power supply, which provides DC power in the form of a square wave at a set frequency, reverse time, and amplitude is applied to the target in the presence of a process gas."

Another problem with Defendants' proposal is their description of a "power supply" as a "power supply, which provides ... power …" rather than a "supply for providing … power." Defendants' proposal is not only unnecessarily prolix; it suggests that the supply must actually, actively, be supplying power in order to qualify. But the claims with this element are apparatus claims, not claims to a process in progress. A power supply is a structure that is part of that apparatus (*i.e.,* the "reactor"). A power supply does not cease to be a power supply when installed

in a device that is not powered on or operating, any more than a battery ceases to be a battery when installed in a device that is powered off. Only Demaray's construction accords with that reality.

E. "Narrow band rejection filter" ('657 Patent, cls. 1, 2, 20; '276 Patent, cls. 1, 6)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "filter which rejects a narrow band of frequencies"	"filter which rejects a narrow band of frequencies, and passes all frequencies outside of the narrow band"

1. This Term Does Not Require Construction

This is another term that should be given its plain and ordinary meaning. If further construction is deemed necessary, the "narrow band rejection filter" is "a filter which rejects a narrow band of frequencies." This understanding is reaffirmed by the contextual claim language providing, *e.g.*, that the filter "rejects at a frequency of the RF bias power supply" (Ex. 2 ('276 Patent), cl. 1), "operat[es] at a frequency of the RF bias power supply" (*id.,* cl. 2), and that an "RF bias [at a frequency] that corresponds to the narrow band rejection filter" (Ex. 1 ('657 Patent), cls. 1, 2). The specifications similarly teach:

> ***Filter 15 prevents the bias power from power supply 18 from coupling into pulsed DC power supply 14***. In some embodiments, power supply 18 is a 2 MHz RF power supply … filter 15 is a 2 MHz band rejection filter. In some embodiments, the band width of the filter can be approximately 100 kHz. Filter 15, therefore, prevents the 2 MHz power from the bias to substrate 16 from damaging power supply 18.

Id., 5:56-65. In this example, the filter is a "2 MHz band rejection filter" and "the band width of the filter can be approximately 100 kHz." *Id.*, 5:61–63. The filter thus "prevents the 2 MHz power from the bias to substrate from damaging the DC power supply." *Id.*, 5:63–65. During prosecution the Applicants similarly emphasized:

> The narrow band rejection filter allows the combination of pulsed-dc power to the target … and an RF bias on the substrate. A filter that blocks too many of the constituent frequencies of the pulsed DC waveform results in the target voltage not attaining a positive voltage. ***A filter that does not block the RF bias voltage can result in failure of the DC power supply.***

Ex. 4 ('657 FH) at DEMINT00002521; *see also* Ex. 3 ('356 FH) at DEMINT00001130 ("The filter

must pass the pulsed DC signal without unduly affecting the shape of that signal ***while rejecting the RF power***."). Demaray's proposal is also consistent with common usage. *See, e.g.,* The New Oxford American Dictionary (defining "narrowband" as "of or involving signals over a narrow range of frequencies"), Ex. 5 at DEMINT00003512; Glew, ¶¶ 50-53.

2. Defendants Seek To Add An Extraneous "Passing" Requirement Into A Term About "Rejection"

Defendants propose to rewrite "narrow band rejection filter" as a "***[i]*** filter which rejects a narrow band of frequencies, and ***[ii]*** passes all frequencies outside of the narrow band." The first clause accurately captures the meaning of the term at issue. Indeed, that clause not only explains the meaning of the term, but does so using every word of the term verbatim, except for "rejection," which it changes to "rejects." The fact that both parties defined the term using its own words shows that there is no real need for interpretation in the first instance.

The substantive problem with defendants' construction is that after defining the term used in the claims (in the first clause of their construction), defendants tack on a second clause that adds an extraneous limitation. The claim term is directed to band "rejection"—the subject of defendants' ***first*** clause—but their ***second*** clause attempts to add a limitation about frequencies the filter "passes." The term at issue says nothing about what the filter does or does not "pass." Rejecting and passing frequencies are different subjects. Filters can reject alone; they can pass alone; or, they can both reject and pass different frequencies simultaneously. Glew, ¶¶ 54-55. Because the claim term here speaks only of rejecting, there is no basis to add "passing" limitations into the claims.[4]

F. "Corresponds to" ('657 Patent, cls. 1, 6), "Rejects at" ('276 Patent, cl. 1), "Operating at" ('276 Patent, cl. 6)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary	Claim language: "frequency **that corresponds to** the narrow band

[4] By analogy, when a court rejects a particular motion pending before it, that does not mean all other pending motions are granted.

meaning	rejection filter" Proposed construction: "frequency, which is within the narrow band of frequencies rejected by the [*narrow band rejection filter*]" Claim language: "narrow band-rejection filter **that rejects at** a frequency of the RF bias power supply" Proposed construction: "filter, which rejects a narrow band of frequencies that includes an RF frequency of the RF bias power supply, and passes all frequencies outside of the narrow band" Claim language: "narrow band rejection filter **operating at** a frequency of the RF bias power supply" Proposed construction: "filter, which rejects a narrow band of frequencies that includes an RF frequency of the RF bias power supply, and passes all frequencies outside of the narrow band"

As a preliminary matter, defendants argue that the larger phrases listed above need construction, rather than the terms "corresponds to," "rejects at," and "operating at." But, defendants (1) repeat the other words of the cited phrases verbatim and/or (2) repeat the language of their proposed construction for narrowband rejection filter (only changing the word order). Claim construction is not an exercise in redundancy. The parties do not dispute that the terms "frequency" and "frequency of the RF bias power supply" do not need construction. Moreover, changing the construction of narrow band rejection filter would needlessly confuse jurors.

1. Plain English Words Like "Rejects At," "Corresponds To," And "Operating At" Do Not Require Rewriting

Defendants propose to supplant the common words "rejects at," "corresponds to," and "operating at" with far longer phrases that contain new, narrowing restrictions unsupported by the claim language. These terms are simple and readily understandable as they appear in the claims. They should take their plain and ordinary meaning, and defendants do nothing to aid clarify that meaning. Indeed, each of defendants' constructions use the term "rejects" or "rejected," underscoring that there is no real need for an interpretation of at least the "rejects at" limitation.

Defendants' proposal to replace these well-understood terms, with new phrases having

different meanings, raises far more questions than it resolves. First, as discussed above, defendants' addition of "passes all frequencies outside of the narrow band" imports new limitations into the claims. These are "comprising" claims, requiring at least a narrowband rejection filter, but not ruling out the presence of other filtering elements. Defendants' proposals are overly broad in other respects. The claims require that the narrow band rejection filter "correspond to," operate at, "or "reject at" a frequency of the RF bias. Defendants propose changing these limitations so the RF bias frequency merely needs to be "within" or "include[d]" in the narrow band rejected. It is elementary that a filter can reject frequencies beyond the frequency on which it is set. Glew, ¶ 58.

Defendants appear to be trying to broaden these terms to capture certain prior art that is the subject of pending IPR petitions. Certain of those petitions, in which both defendants are real parties in interest, rely on the "Hirose" reference (Patent 6,485,602) as disclosing a narrow band rejection filter. But Hirose does not have a narrow band rejection filter that "rejects at" or is "operating at" the frequency of the RF bias power supply, nor does its RF bias frequency "correspond to" the narrow band rejection filter. Rather, Hirose affirmatively seeks to offset its filter from the frequency of the RF power supply. Ex. 11, Fig. 6. Through redefinitions that include rejection of any frequency that "includes" or is "within" the frequency range of the narrowband rejection filter, as opposed to focusing on the frequency of the RF power supply as in the claims, defendants seek to expand the claims to encompass prior art. This is improper. *Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 1153 (Fed. Cir. 1997) ("claims should be read in a way that avoids ensnaring prior art if it is possible to do so").

G. "Reconditioning the target" ('657 Patent, cl. 1)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "cleaning and conditioning the target"	"conditioning the target between depositions"

1. This Term Does Not Require Construction

"Reconditioning the target" should be given its plain and ordinary meaning. If further construction is deemed necessary, it can be construed as "cleaning and conditioning the target." The patents explain that "the recondition process (or burn in) consists of both sputtering in metallic mode and then sputtering in poison mode to condition target 12." Ex. 1, 20:53–55. The metallic mode is used to clean the target: "target 12 is cleaned by pure Argon sputtering in the metallic mode." *Id.*, 17:10–11. "The target is then conditioned in poison mode." *Id.*, 18:13–15 ("Target 12 was then conditioned in poison mode by flowing 60 sccm of Argon and 40 sccm of oxygen respectively"); *see also id.*, 18:11–15 ("Target 12 was first cleaned by sputtering with Ar (80 sccm) only in the metallic mode. Target 12 was then conditioned in poison mode by flowing 60 sccm of Argon and 40 sccm of oxygen respectively."). In accord with these teachings, dependent claim 1 of the '657 patent provides that "reconditioning the target includes reactive sputtering in the metallic mode and then reactive sputtering in the poison mode," and nothing suggests that the patentee intended any narrower meaning.[5]

2. Defendants Seek To Add An Unsupported Temporal Limitation Requiring Multiple Depositions

Defendants again propose a construction where none is required. By repeating the term "conditioning," defendants admit that the term does not genuinely need construction.

Defendants seek to add a temporal limitation requiring the "reconditioning" to occur "between depositions." But the claim term does not contain any restriction on ***when*** reconditioning occurs. The reconditioning process could be used after the claimed film deposition, regardless of whether another film deposition takes place. It could occur before any depositions have happened, *e.g.,* if the target has built up an insulating layer during set-up. Or it could occur after multiple

[5] *See also, e.g,* Ex. 7 at DEMINT00003502 (McGraw-Hill Dictionary of Scientific and Technical Terms defines "reconditioning" as "[r]estoration of an object to a good condition"); Glew, ¶ 59.

depositions have been completed. The claim is simply not restricted in these respects. Glew, ¶¶ 59–64. Defendants' ambiguous rewriting might also be used to argue, incorrectly, that reconditioning is required between every deposition process.

Defendants seek to import their extraneous temporal limitation from certain examples from the specification. Although the specification provides examples in which the target is reconditioned "[b]efore" or "prior to" depositions, these are merely examples: "[t]hese examples are provided for illustrative purposes only and are not intended to be limiting." Ex. 1, 16:40–42; *see also id.*, 20:52–60 ("The drift can be stabilized by recondition target 12 prior to deposition … FIG. 32 shows the much improved drift in the index of refraction and the photoluminescence when target 12 is reconditioned between subsequent depositions."), 17:10–14 ("Before each film deposition, in step 401, target 12 is cleaned by pure Argon sputtering in the metallic mode. Then target is then conditioned in poison mode with the oxygen flow much higher than the flow required at the transition region."); 20:52–53 ("The drift can be stabilized by recondition target 12 prior to deposition."). There is simply no requirement in the claims, specification or elsewhere that reconditioning happen "between depositions."

H. "Metallic mode" ('657 Patent, cls. 1, 2), "Poison mode" ('657 Patent, cls. 1, 2)

Demaray's Proposal	Defendants' Proposal
metallic mode: "mode of operation in which the surface of the target is substantially metallic" **poison mode**: "mode of operation in which the rate of the thin film formation on the surface of the target equals or exceeds the rate of sputter removal of the surface of the target"	Plain and ordinary meaning

1. Demaray's Proposed Constructions Are Consistent With Plain And Ordinary Meaning

Most lay jurors would never have heard of "metallic mode" or "poison mode," and would not understand them without some explanation. Demaray's constructions for the terms are consistent with their plain and ordinary meaning in the art and with industry practice. Glew, ¶ 69.

As previously discussed, a problem that occurs during reactive thin film PVD is "poisoning" of the target. Glew, ¶¶ 65-69; *see also Asahi Glass Co. v. Guardian Indus. Corp.*, 886 F. Supp. 2d 369, 390 (D. Del. 2012) (explaining that "metallic mode sputtering" was a mode of operation to "deposit compounds (like metal oxides and nitrides)," but that "the deposition rate slows by an order of ten due to the buildup of oxide on the target surface ('poisoning')"). Demaray's explanation of metallic mode comes verbatim from the patents: "[r]eactive sputtering from a metal or metallic alloy target 12 can be characterized by two modes of operation. In the first mode, which is sometimes referred to as the 'metallic mode' ***the surface of target 12 is substantially metallic***." Ex. 1, 11:27–37; *see also id.,* 10:61–67 ("… apparatus 10 is operated with pure Ar gas only (referred to as the metal mode) in order to sputter away a [metal] surface layer of target 12 ….").

Similarly regarding poison mode, the specification discloses that in poison mode with (in this example) oxygen as the reactive gas (thus forming oxide in the example), "***the rate of oxide formation on the surface of target 12 equals or exceeds the rate of sputter removal of the surface of target*** 12 by the moving magnetron 20. ***This condition is sometimes referred to as the 'poisoned mode'***." Ex. 1, 11:66–12:9; Glew, ¶ 68.

To be clear, the patents' description of poison mode in the citations above are for an embodiment in which oxide films are formed by the chemistry used in that example, but the patents make clear that poison mode applies more broadly to "various films." Ex. 1, 16:19–24 ("Therefore, depositions of ***various films*** in embodiments of apparatus …."). While certain dependent claims are limited to an "oxide material" (*id.*, cl. 2), others are not. The specification discloses using other reactive gases that would give rise to films other than oxides. *Id.*, 7:47–52 ("Other gasses such as N_2, NH_3, CO, NO, CO_2, halide containing gasses other gas-phase reactants can also be utilized."), 3:5–9 ("Process gasses can be fed into the reaction chamber of the reactor

apparatus. In some embodiments, the process gasses can include combinations of Ar, N_2, O_2, C_2F_6, CO_2, CO and other process gasses."); Glew, ¶ 24.

I. "Substantially constant" ('276 Patent, cl. 10)

Demaray's Proposal	Defendants' Proposal
Plain and ordinary meaning, or "within about 10°C"	Claim language: "the temperature of the substrate substantially constant" Proposed construction: "controlling the substrate temperature to be at or within 10°C of the set temperature"

Defendants again argue that the larger phrase listed above needs construction, rather than the term "substantially constant." But Defendants merely reorganize the words "temperature of the substrate" to "substrate temperature," confirming that these terms need no further construction.

1. The Term "Substantially Constant" Does Not Require Construction

"Substantially constant" should be given its plain and ordinary meaning. If further construction is deemed necessary, it can be construed as "within about 10° C." The patents explain that "[t]he substrate temperature can be held constant in the range of about −40° C to about 550° C and can be maintained at a chosen temperature to ***within about 10°C*** by means of preheating substrate 16 and the substrate holder prior to deposition." Ex. 1, 9:30–34; *see also id.,* 3:3–5 ("[t]he temperature of the substrate can be controlled to ***within about 10°C*** …."); Glew, ¶¶ 70–71.

2. Defendants Seek To Unnecessarily Rephrase The Claim Language

Defendants suggest adding the term "controlling" to the claim. This makes no sense in context as the claim would read: "[a] temperature controller for ***holding controlling*** the substrate temperature …." And, "holding" and "controlling" can mean different things. Glew, ¶ 73; *see* Ex. 5 at DEMINT00003885-3887. Defendants also improperly import (1) a hard limit of 10°C and (2) the concept of "the set temperature," where a POSITA would understand that minor fluctuations beyond 10°C are anticipated, substrates do not always have a uniform temperature, and the claims are not limited to a single processing temperature. *Id.*, ¶¶ 71–74.

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CERTIFICATE OF SERVICE

A copy of the foregoing instrument was served or delivered electronically via the Court's electronic court filing system to all counsel of record on this 16th day of February, 2021.

/s/ Mariandrea Mueller

Mariandrea Mueller